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BULK HANDLING OF MILK

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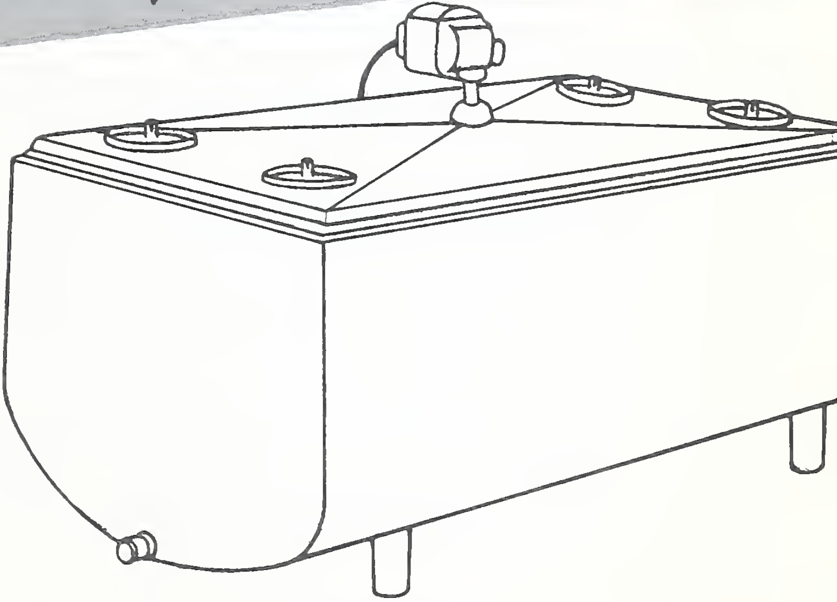
its economy to farmers



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CONTENTS

Page

WHAT IS BULK HANDLING? 3

ITS ADVANTAGES 4
  Less loss of milk 4
  Saves lifting of cans and may save time 4
  May bring price premiums and reduced hauling costs 6

ITS DISADVANTAGES 6

COSTS OF OWNING AND OPERATING A BULK TANK 6
  The initial cost 7
  Annual costs 9

HOW TO MAKE FULL USE OF BULK HANDLING 11

HOW SOME FARMERS ADJUSTED TO BULK HANDLING 14
  Farm A - A small specialized dairy farm in the Northeast 14
  Farm B - A large dairy-hog farm in the Midwest 15
  Farm C - A small dairy-hog farm in the Midwest 16
  Farm D - A large grade-A dairy farm in the South 16
  Farm E - A large dry-lot dairy farm on the West Coast 17

POINTS TO CONSIDER IN DECIDING WHETHER TO BUY A BULK TANK 17

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BULK HANDLING OF MILK
Its Economy to Farmers

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Bulk handling of milk is a new and expanding technique on dairy farms. Farmers first began to use it in the late thirties, but bulk handling of milk did not develop rapidly until after 1950. By the summer of 1957, at least 60,000 bulk tanks were in use on dairy farms in this country.

WHAT IS BULK HANDLING?

Bulk handling is a system of cooling, holding, and transporting milk in bulk, in contrast to the usual method of handling milk in cans. On the farm, the warm milk from the cow is cooled rapidly and kept cool in a refrigerated tank until it is picked up by the hauler.

Many different makes of tanks are available, but there are only two basic types--the direct-expansion and the ice-bank, or sweet-water. In a direct-expansion tank, the milk is cooled directly by the refrigerant, which is in contact with the lining of the tank. In an ice-bank tank, the milk is cooled by water. The water in turn is cooled by a bank of ice that is built up by the refrigeration system.

These two types of tanks need somewhat different refrigeration and electrical equipment. The direct-expansion tank must have a relatively large compressor and motor because the cooling is done during the milking period and a short time thereafter. The ice-bank tank needs a smaller motor and compressor than the direct-expansion tank, but it operates for a longer period each day.

Bulk handling of milk, particularly when used in combination with pipeline milkers and loose housing of cows, removes much of the heavy lifting involved in dairy farming and permits workers to operate more efficiently. But these things require substantial investments. Then too, they may not always be profitable. A farmer who is thinking of getting bulk handling or other labor-saving equipment should ask himself these questions, "Will it pay?" and "If not, will its convenience be worth the cost?"

In making decisions on bulk handling, farmers do not always have the freedom of choice that they have with other devices or methods. A farmer may either be obliged to adopt bulk handling or give up dairy farming in favor of other farm enterprises or off-farm work. In the past, existing sanitary codes have sometimes restricted bulk handling but, generally speaking, restriction of this kind is no longer a problem.

Once a dairy farmer has a bulk tank, he must decide how to make the best use of it as well as how to pay for it. If the tank saves time for the labor force, how should the workers use this time? How can the farmer reorganize his farm and make it more efficient so that he can pay for the tank and also increase his net income? What related devices, such as pipeline milkers and milking parlors, are desirable?

ITS ADVANTAGES

Many advantages of bulk handling have been claimed. Some of them are justified. Dairy farmers who have installed tanks have found the main advantages to be reduced losses of milk, less heavy lifting, sometimes actual savings in time, and often price premiums or reduced hauling charges.

Less Loss of Milk

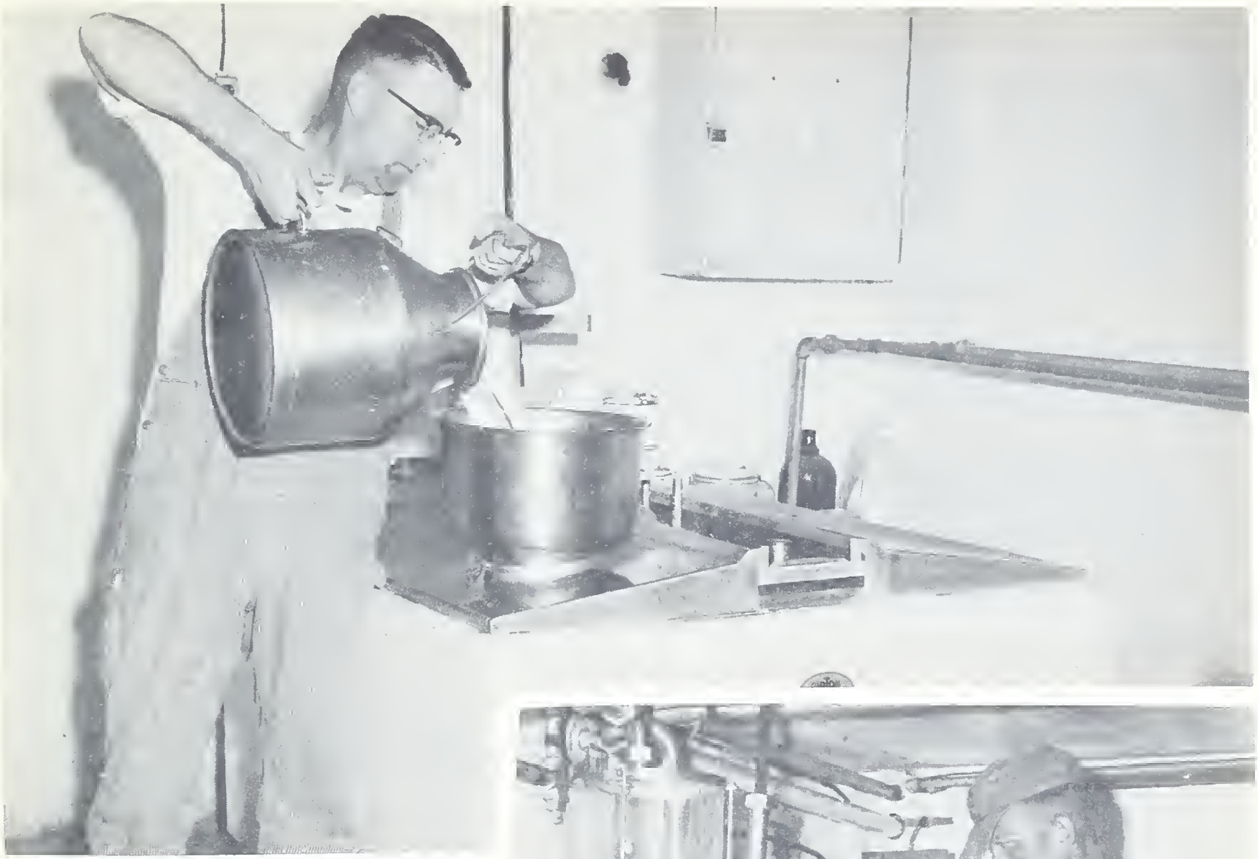
Shrinkage losses of milk are ordinarily less with bulk handling than with cans. With cans, losses may result from milk being spilled, from incomplete drainage, or from milk sticking to inside surfaces of the can. The most important saving with bulk handling probably is from reduced stickage. The surface area is much smaller per gallon of capacity in a bulk tank than in a 10-gallon can. Also, the milk is measured in the tank and the dealer usually takes title to the milk at that point.

The extent of these savings vary from farm to farm, depending on circumstances. A widely accepted figure is a saving of around one-half pound of milk for each 100 pounds handled. If milk is valued at $4.00 per hundredweight, the saving would be 2 cents for each 100 pounds sold. In the course of a year, this could easily amount to $40.00 or more for an average farm.

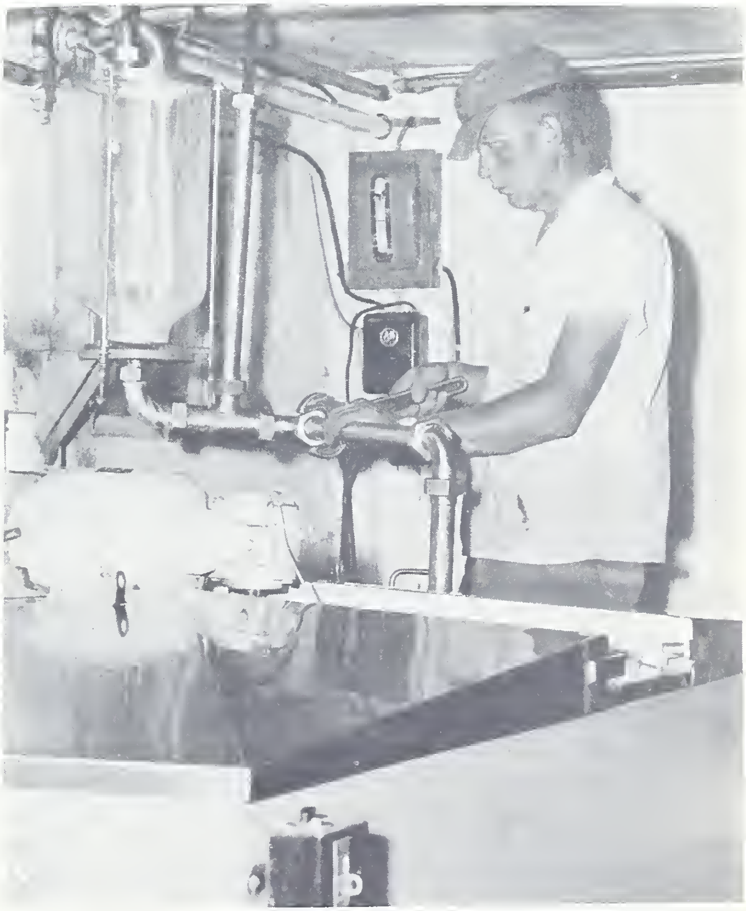
It is often said that a bulk tank means a higher fat test, but no conclusive evidence on this point is available. Some dairy farmers may receive a slightly higher test after shifting to bulk; others may receive a slightly lower test. The change, if any, is likely to be small. But for most dairy farmers, bulk handling should mean a more accurate test.

Saves Lifting of Cans and May Save Time

Bulk handling eliminates the job of lifting milk in cans. It may also mean actual savings in time on many dairy farms. For one thing, the can-washing job at the farm--a requirement in some milksheds--is done away with. Also, the heavy cans must be handled in the milkhouse and, on many farms, they are moved down the farm lane to a pickup point on the highway. With a bulk tank, these operations are eliminated. On a 2-man dairy farm, the resulting savings in time could amount to as much as an hour daily. But the saving in time is



Many dairy farmers, particularly those who milk in stanchion barns, pour the milk into the bulk tank. If this is to be done, the height of the tank is important.



Other farmers use a pipeline milker which moves the milk directly into the bulk tank. This is best adapted to milking-parlor systems as they permit short pipelines.

not likely to be large enough to permit any reduction in the number of workers on the farm. The result is more likely to be a shorter working day or an increase in volume of business within the same length of day. When combined with the reduction in heavy lifting, these possibilities should make it easier for dairy farmers to attract and hold the skilled workers they need.

May Bring Price Premiums and Reduced Hauling Costs

To date, adoption of bulk handling by many dairy farmers has meant either a price premium, a reduced hauling charge, or both. The price premium usually ranges from $0.05 to $0.25 per hundredweight of milk, and the reduced hauling charge has almost the same range. In a few situations, the combined premium has been as high as $0.40 per hundredweight. More commonly, it has been in the neighborhood of $0.10 to $0.15. These premiums may not continue indefinitely but they are an incentive for dairy farmers to shift from cans to bulk handling.

ITS DISADVANTAGES

What are the disadvantages of bulk handling? First and most important, it takes a lot of money to buy and install a bulk tank. This is the main problem; it is taken up in detail later.

There is also the danger that an entire tank of milk may be rejected because of off-flavor milk from 1 cow. With cans, the loss might be limited to 10 gallons or less. Usually, however, the problem of off-flavor milk is not serious and farmers can handle it by careful management. Actually, very little milk from bulk tanks has been rejected. Records from some 60 farmers in various sections of the United States who had used bulk handling for 1 to 10 years show that none of them had lost any milk in this way since bulk tanks were installed on their farms.

In some types of bulk tanks, the milk may freeze. Usually, freezing can be avoided by proper timing. The cooling operation should not be started until a specified quantity of milk has entered the tank.

COSTS OF OWNING AND OPERATING A BULK TANK

Most farmers who are thinking of buying bulk tanks already have equipment for cooling and holding milk. It may be nothing more than a concrete tank in which cans of milk are cooled by spring or well water. More often, it is a mechanically refrigerated box designed to cool and hold milk in cans at specified temperatures. In any case, this equipment represents an investment that may be partly or completely lost if the farmer shifts to bulk handling. The financial problems involved are likely to differ depending on whether the equipment that needs to be replaced is new or old.

The salvage value of the old equipment depends on both its condition and the demand for such items. A can cooler 15 years old and in poor condition obviously has little sales value. A can cooler only 3 years old that is in good repair has considerable use left in it, but what it will actually sell for will depend on the market. If a sizable number of dairy farmers in the area still use cans and plan to continue using them, the demand for can coolers may be good. But if most of the farmers in the area have already converted to bulk handling and the few who still use cans plan a shift soon, the demand for cans and can coolers will be low.

The Initial Cost

The market price of a bulk tank, as mentioned earlier, is relatively high. At 1957 prices, even a 100-gallon tank--the smallest regularly sold--costs from $1,000 to $1,500 installed, depending on type, make, discount from list price, and other factors. A 300-gallon tank, which is adapted to medium-sized herds, usually cost $2,000 or more.

Initial costs of farm bulk tanks of different sizes in 1957 are given below:

Capacity (gallons)	Initial cost installed		Initial cost per gallon of capacity
	Range	Average	
	Dollars	Dollars	Dollars
60	950 - 1,200	1,075	17.90
100	1,000 - 1,500	1,250	12.50
150	1,400 - 2,000	1,700	11.30
200	1,700 - 2,300	2,000	10.00
250	1,900 - 2,500	2,200	8.80
300	2,100 - 3,000	2,550	8.50
400	2,500 - 3,200	2,850	7.10
500	2,900 - 3,500	3,200	6.40
600	3,200 - 3,900	3,550	5.90

The investment in a bulk tank depends first on how large a tank is needed. The size in turn depends on the amount of milk produced at the seasonal peak, how often the milk is collected, and the allowance for future expansion. On most dairy farms, production of milk varies widely by seasons. A farm with an average production of 100 gallons daily might produce only 70 gallons daily in the short season and 140 gallons or more for a few weeks in the flush season. The tank must be large enough to handle the 140 gallons, unless arrangements can be made for extra pickups during the peak season. This means that the tank is used at less than capacity for the rest of the year. Over the years, of course, it may be possible to reduce seasonal variation and thus to make better use of the tank.

How often the milk is picked up also affects the size of tank required. Bulk milk is now collected daily or, more commonly, every-other-day. Every-other-day pickup is likely to increase, as it means a saving in hauling costs. A milk producer who is thinking of buying a bulk tank should check both current and longtime expectations as to frequency of pickup. Generally speaking, every-other-day pickup requires a tank twice as large as daily pickup. Sometimes a farmer can work out an arrangement whereby his milk is collected daily during the flush season and every-other-day for the rest of the year.

As dairy farmers adopt new methods, they tend either to add cows to the herds, to increase milk production per cow, or both. This means that the tanks should be large enough to permit future expansion. Whether this should be 10 or 20 percent, or even more, will vary from farm to farm.

A farmer who is trying to decide how large a tank to buy must consider all these factors together. As tanks come in specified sizes only, some levels of milk production make better use of a tank than do others. For example, a farmer whose cows produce 120 gallons of milk daily and one whose cows produce 140 gallons daily would need tanks of the same size.

Sizes of bulk tanks and can coolers required for different levels of milk production are shown below:

Daily production		Size of bulk tank 1/		Size of can coolers, daily pickup 2/	10-gallon cans
Average	Peak	Daily pickup	Every-other-day pickup		
Gallons	Gallons	Gallons	Gallons	Cans	Number
20	28	60	100	3	6
40	56	100	150	6	12
60	84	150	250	10	18
80	112	150	300	12	24
100	140	200	400	14	28
120	168	250	500	20	34
140	196	250	500	20	40

1/ To handle peak production, plus a 25-percent reserve.
2/ Assuming capacity to handle both night and morning milkings.

In changing to bulk handling, funds may be needed for necessary changes in the milkhouse. It is often necessary to do some rewiring. Sometimes a new water heater or even a new milkhouse is called for. Unless a new milkhouse or a new driveway is required, these related costs are usually small compared with the cost of the bulk tank.

Annual Costs

With any piece of farm equipment, the farmer has two types of costs. First is the overhead or fixed cost. This cost includes depreciation, interest on the investment, insurance, and any other item of cost that is not related to the amount the equipment is used. This type of cost is closely related to the initial investment required. It is often called "ownership" cost.

Fixed Costs

The main items in the fixed costs for a bulk tank or a mechanical can cooler are depreciation and interest. A tank or a can cooler gradually depreciates over the years to a point at which it has very little, if any, value. In computing annual depreciation, both the original cost and the probable length of life of the piece of equipment must be considered. That is, while one type of equipment may require a bigger investment than another, the larger investment could be offset by the longer life of the equipment.

The evidence as to the useful life of bulk tanks is not conclusive. Until further evidence is available, it seems reasonable to assume that a new tank, unless it becomes obsolete sooner, will last at least as long as a new can cooler--say in the neighborhood of 15 years. This means that the annual fixed cost for bulk tanks and can coolers can be compared roughly on the basis of the investment in each, with the annual cost amounting to about 10 percent of the investment. The cans themselves last only about 5 years on the average, and their costs should be figured separately.

Operating Costs

The second type of cost is operating cost. This cost includes items that vary with use. With a bulk tank, the operating costs are mainly for electricity. Repairs appear to be a minor item. With can handling, the main operating costs are for electricity and repairs. Repairs are particularly important so far as the cans are concerned.

The amount of electricity needed to cool a given quantity of milk varies, depending on the cooler. Different types and makes of bulk coolers differ in this respect. The more efficient types and makes can be expected to use less current than a mechanical can cooler. The reverse could be true for the less efficient bulk coolers. Usually, however, electricity is a minor cost compared with the fixed costs.

For an average dairy farm, the most efficient bulk cooler might use electricity costing $30 a year. A can cooler or one of the less efficient bulk coolers would not be likely to use more than $40 to $50 worth of energy. The difference of $10 to $20 is important, but it should be looked at along with the corresponding figures for annual fixed costs, mainly depreciation and interest.

Suppose for example, that the bulk cooler which uses electricity most efficiently costs $300 more installed than the less efficient type. If so, annual depreciation and interest on the tank would exceed that on the second tank by $25 to $30 a year (assuming a 15-year life) and would more than offset the saving in electricity. Generally speaking, each $100 difference in investment in a bulk tank or a can cooler means a difference of about $10 in annual fixed costs. The more expensive tank may be a good investment if for each $100 of additional investment, as compared with a cheaper tank, it saves $10 in electricity.

In comparing bulk tanks with can coolers, the difference in investment is usually so large as to override any difference in use of electricity. This is true particularly for the smaller dairy farms.

So far as electricity is concerned, the operating costs of bulk tanks may be complicated by the possibility that electric rates may be raised as a result of heavy loads put on powerlines by tanks, particularly the direct-expansion type. In a few scattered instances, the load problem has resulted in an additional demand charge of around $2.50 per horsepower per month for tanks of this type. But these cases are exceptions. Most dairy farmers can choose a tank without serious concern as to this point. Among the 60 farmers previously mentioned who had used bulk handling for 1 to 10 years, none had been faced with such a charge. But any farmer considering a bulk tank would do well to check the possibility of a demand charge with his local power supplier.

Net Costs

In considering a bulk tank, the important thing is the net cost--the net effect of changes in cost balanced against savings and price premiums. Higher annual costs are justified if a bulk tank results in enough savings and premiums to equal or exceed the higher costs.

As mentioned earlier, bulk handling ordinarily reduces milk losses on the farm, should mean a more accurate fat test, and may save time. Then, too, many dairy farmers who adopt bulk handling can also expect a small price advantage in the form of either a price premium or a reduced hauling charge. Farmers should consider all of these things, along with cost, in arriving at a decision as to the economic advantage or disadvantage of handling milk in bulk.

The decision depends on the situation of the individual farmer--the size of tank he needs, the condition of his existing can cooler and cans, the probable reduction in milk losses with a bulk tank, the likely price premiums, if any. These and other things that affect his situation need to be considered by the farmer in question in arriving at an economic answer. Also involved are certain intangibles, such as the value to be placed on the fact that bulk handling eliminates the lifting of heavy cans of milk, or the possibility that sooner or later there may be no market for milk in the area except that in bulk. Only the operator of an individual farm can balance all of these items and arrive at the answer for his situation.

To illustrate this, let us work out examples for certain typical farms. The farms vary in size, but we shall assume that on each farm these conditions or pieces of equipment are found:

1. Can cooler 7 years old of a size suitable for daily pickup of milk.
2. Bulk tank of a size suitable for pickup every-other-day, with 25 percent reserve capacity.
3. Fifteen-year life for the can cooler and for the bulk tank, with 5 percent interest on the undepreciated balance.
4. Bulk handling saves 0.5 pound of milk, valued at $0.02, for each 100 pounds sold.
5. No change in quantity of electricity or labor used or in cost of repairs for the bulk tank as compared with the can cooler.
6. No price premium for bulk milk.
7. Reduction in hauling charge of 0.05 per hundredweight for bulk milk.

These examples are summarized in table 1 which brings out the fact that additional investment is usually required for a bulk tank, thus increasing annual costs. It also shows the heavier impact of the change on the smaller farms. Under the assumptions used here, a price premium of around $0.12 per hundredweight would be necessary to balance the net additional costs on the smaller farms. No premium would be needed on the larger farms.

HOW TO MAKE FULL USE OF BULK HANDLING

Once a dairy farmer has made the rather substantial investment needed for a bulk tank, he is interested in making full use of it. Fortunately, bulk handling, particularly when combined with certain related devices, such as pipeline milkers and milking parlors, opens the way for broader changes in farming that should mean more income. In the long run, farm adjustments to increase net incomes probably offer a sounder approach to the problem of paying for a bulk tank than does dependence on price premiums or reduced hauling charges.

Most farmers have opportunities to adopt improved methods that can reasonably be expected to increase net income. These opportunities are found in all phases of dairy farming--production and harvesting of feed, breeding and feeding of cows, seasonality of milk output, and efficient use of labor in the field and in the barn. Often an improvement in one phase depends on related changes in another phase. For example, a bulk tank and pipeline milker may take some pressure off the farmworkers, perhaps not enough to lead to a change in the number of workers but enough to enable the workers to handle a few more cows easily, so far as milking and milk-handling operations are concerned. But more cows mean changes in feed supply, housing, and other phases of the dairy-farm business. That is, the improvements in different parts of the farm business need to be related and to go along together.

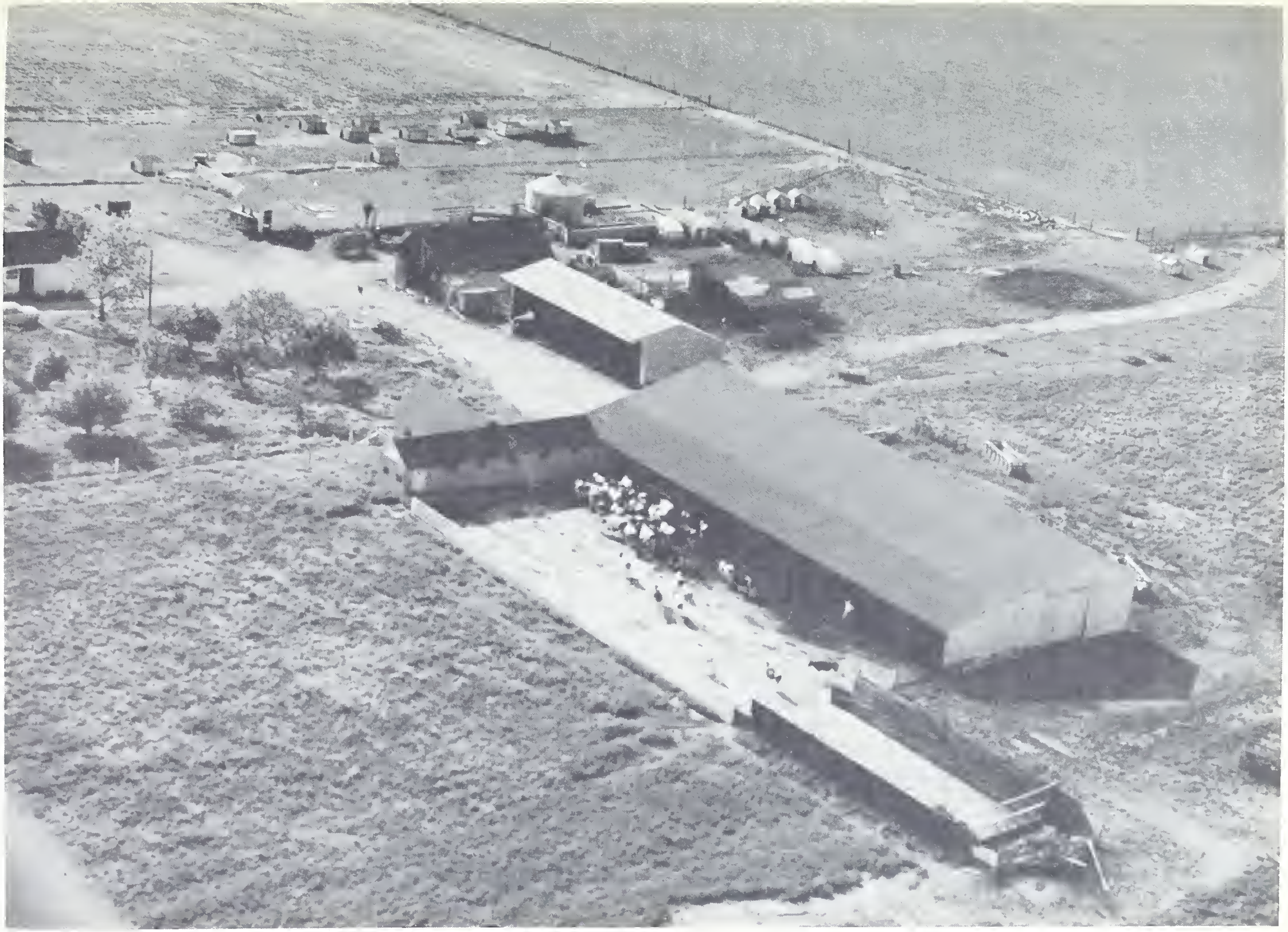
Table 1.- Economic effects of shifting to bulk handling on dairy farms of different sizes

CHARACTERISTICS OF FARMS

Item	Size of farm as measured by average daily milk production			
	20 gallons	60 gallons	100 gallons	140 gallons
Peak daily milk production--gallons--	28	84	140	196
Annual milk sales--------------cwt.--	600	1,800	3,000	4,200
Equipment replaced by bulk tank:				
Can cooler-----------can capacity--	3	10	14	20
10-gallon cans-------------number--	6	18	28	40
Size of bulk tank required--gallons--	100	250	400	500

ECONOMIC EFFECTS

	Dollars	Dollars	Dollars	Dollars
Investment in bulk tank installation:				
Tank installed--------------------	1,250	2,100	2,750	3,000
Milkhouse changes-----------------	80	80	80	80
Salvage, can cooler---------------	- 70	- 140	- 200	- 250
Net additional investment--------	1,260	2,040	2,630	2,830
Increased annual investment costs----	126	204	263	283
Annual savings:				
Elimination of can maintenance-----	12	36	60	84
Reduced hauling charge-------------	30	90	150	210
Value of milk saved----------------	12	36	60	84
Total----------------------------	54	162	270	378
Change in annual net returns:				
Total----------------------------	- 72	- 42	+ 7	+ 95
Per hundredweight of milk----------	- 0.12	- 0.02	0	+ 0.02



Bulk handling fits well in modern dairy-farm setups that use loose housing, milking parlors, and pipeline milkers.

Bulk handling is a step in the mechanization of dairy farming. Along with other devices, such as milking machines, barn cleaners, and silo unloaders, it enables farmworkers to produce more efficiently and helps to eliminate drudgery. Ordinarily, these devices are profitable to farmers who take full advantage of them. In most instances, the result is more milk per farm and per man. This increase results not only from mechanization but also from companion adjustments in production of forage and in other phases of dairy farming. These devices are less profitable to farmers who adopt them without making the related adjustments. All dairy farmers are affected pricewise by whatever influences these technological changes have on the overall production of milk and thus on prices received.

Apparently, bulk handling of milk will continue to contribute to the longtime trend of greater production per man, per acre, and per farm for dairy farmers who have the resources and the quality of management to take advantage of modern technology. Dairy farmers who lack the resources or the qualities of management needed are in a difficult competitive situation. Some of these operators have shifted to other types of farming or to off-farm employment. These trends have been going on in all major dairy areas and may be expected to continue. But they may operate at different rates in different areas because of differences in resources and other factors. Thus, in the years ahead, they may affect the relative importance of the various dairy regions.

HOW SOME FARMERS ADJUSTED TO BULK HANDLING

Farm A - A Small Specialized Dairy Farm in the Northeast

Farm A, which has 100 acres of cropland and 12 cows, is typical of a significant group of specialized dairy farms that now carry small herds but which have possibilities for expansion. The operator of this farm, who is 39, changed to bulk handling of milk in 1956. He had the choice of doing this or finding another milk market. He chose a bulk tank of 150-gallon capacity, which is large enough to handle four milkings at the peak season. It has the excess capacity to allow milk output almost to double.

The tank cost $1,500 installed but a new milkhouse was needed also. With wiring and plumbing, this brought the total investment to about $2,300, which was financed through a local bank. Sale of the old cooler, which was nearly worn out, brought in $50.00. As he would have had to buy a new can cooler soon at a cost of about $500, the net additional cost of the bulk installation can be figured at $1,800.

The operator of this farm likes his bulk tank. He believes that it makes his milk-handling job easier and also saves a significant quantity of milk. He receives no price premium, but he does benefit from a 10-cent reduction in the hauling charge per hundredweight of milk. Also, he is freed from the expense of maintaining milk cans. But the higher investment in the bulk tank means about $180 more in fixed costs annually. This leaves him with a decrease in net returns of around $100 per year. That is, the immediate effect of the shift was to decrease his net income. But he plans to expand his herd to about double its present size. He has the land and the milk-handling facilities to permit such an expansion, but he will need to remodel his barns. With good management, the expansion should be profitable. The bulk tank has a part in making it possible. It makes dairying easier and thus takes pressure off the labor force.

But not all small dairy farmers have been able or willing to adjust in this way. The operator of farm A has a neighbor whose situation is similar, but who did not respond in the same way. This neighbor, who is 62, had 8 cows on 70 acres of cropland. Probably, he was a less able manager than the operator of farm A. In any case, when faced with the same choice, he decided to quit dairying entirely but to continue to live on the farm and perhaps to expand his custom work off the farm. Other neighbors have chosen a third alternative. They have shifted to outlets that still accept can milk, although they recognize that this may be only a temporary solution.

In this community, 33 farmers who had been selling milk to the same dealer were faced with choosing among these 3 alternatives. Nineteen, who averaged 24 cows each, decided to shift to bulk handling. Fourteen, who averaged about 8 cows each, decided not make the change. Ten of them shifted to other dealers who still accepted can milk, and four stopped selling milk.

Farm B - A Large Dairy-Hog Farm in the Midwest

The operator of farm B in southern Wisconsin has 70 cows on some 300 acres of open land. He fattens around 200 hogs each year. The milk produced goes to Chicago for fluid use. The operator, who is 37, shifted to bulk handling and to a different fluid outlet, in 1954, when he was offered a substantial price premium and when it became obvious that his existing can facilities would need to be expanded to handle his gradually increasing output of milk. He had already installed a milking parlor and pipeline milker. He bought a 400-gallon tank, which was large enough to hold 3 milkings at the seasonal peak. The tank and a new water heater cost $2,550 installed. His old can cooler and cans brought $150, leaving a net increase in investment of $2,400.

The operator of farm B is enthusiastic about bulk handling. He says that the tank saves milk, electricity, and the lifting of heavy cans. But most important has been the price premium, which has averaged around $0.30 per hundredweight. This amounts to more than $2,000 a year for his large herd of high-producing cows. It more than offsets the increased investment cost of about $240 annually. The price premium may not continue indefinitely, but even without it, his savings in milk, can maintenance, and electricity would more than offset the increased annual cost of investment.

The adjustment to bulk handling on this farm has been satisfactory. The farmer would not go back to cans even if bulk milk carried no premiums. At one time, he milked only 22 cows in a stanchion barn, but several years ago he built a pen barn-milking parlor combination. Later, he added a pipeline milker and gradually expanded his herd to 70 cows. He plans to expand further to about 100 cows. This will mean fewer hogs and he will need a larger bulk tank as well as a larger pen barn and more storage for hay. His proposed expansion to 100 cows is made feasible by the combination of related facilities of which the bulk tank is a part.

Farm C - A Small Dairy-Hog Farm in the Midwest

Farm C lies only a few miles from farm B, but it is smaller, less specialized, and has a cheese-factory outlet for milk. The operator, who is 55, had used a holding tank for cans and well water for cooling. He shifted to bulk handling in 1953 with a rented tank supplied by the firm that bought his milk. The 150-gallon ice-bank tank is large enough for 2 milkings at the seasonal peak. The cost of $1,285 installed was paid by the milk buyer. The operator had to build a new milkhouse, which cost about $800 cash plus his own labor. Rental for the tank is about $0.06 per hundredweight of milk, and the operator can buy the tank if he wishes to do so. He receives no price premium for bulk milk, but his hauling charge is reduced.

The operator of this farm believes that bulk handling saves milk, and results in a slightly higher fat test. It saves the lifting of heavy cans and the time and expense required to pump water for the open cooling tank he had used previously.

Farm C illustrates the shift from cooling with well water to bulk-tank cooling. The operator is pleased with the shift, even though he had to invest a substantial amount in a new milkhouse. He believes that bulk handling is the coming thing for manufacturing milk as well as for milk going into fluid use. Apparently, he is satisfied with the rental arrangement, which probably gives him use of the tank at lower cost than would ownership of it. He plans to increase his herd from 23 to about 30 cows and to reduce the hog enterprise somewhat.

Farm D - A Large Grade-A Dairy Farm in the South

Farm D in South Carolina is fairly typical of the Grade-A dairy farms that supply fluid milk for a number of southern cities. The farm contains 500 acres of open land and supports an 80-cow herd, along with a moderate-sized hog enterprise and cotton and soybeans as cash crops. The operator shifted to bulk handling in 1955, when his milk dealer, who bought milk from some 80 producers, shifted entirely to bulk milk.

This farmer chose a 400-gallon direct-expansion tank. At the time he installed the tank, it was large enough for every-other-day pickup for the 60 cows then in the herd. But he has since increased his herd to 80 cows and at seasonal peaks the tank is too small. The tank cost $3,000 installed but salvage of the old cooler and cans reduced this amount by about $600.

The operator of this farm likes bulk handling. He believes that it saves milk, results in a fat test higher by one-tenth of 1 percent, and saves labor because can washing is eliminated. He receives no price premium, but his hauling charge has been reduced slightly.

He had installed a pen barn--milking parlor-pipeline milker combination in 1952. Bulk handling ties in well with these devices. He plans to expand his milking herd to about 120 cows. When this occurs, he will need a larger tank or a second tank unless he can arrange for a shift to every-day pickup. He may also need to reduce other enterprises, although to some extent the expansion in number of cows is a continuing adjustment to a reduced cotton allotment.

Farm E - A Large Dry-Lot Dairy Farm on the West Coast

The operator of Farm E has 470 milking cows on 10 acres. His farm illustrates the type of dairying found near some of the west coast cities. He buys all his feed and all herd replacements. The cows are milked in shifts in a stanchion-type barn. The milk is picked up daily and production varies only slightly with the seasons.

The bulk tank on this farm is a 2,000-gallon unit, which was installed in 1952 at a cost of around $7,000. It is an insulated holding tank with a direct-expansion external cooler. It replaced a bulk tank bought in 1947. Bulk handling has been used for 10 years on this farm and even longer on neighboring farms. All milk produced in the area is handled in bulk, and the operator of farm E is not inclined to think in terms of alternatives. He says that the bulk tank saves both milk and labor, particularly by eliminating can washing.

POINTS TO CONSIDER IN DECIDING WHETHER TO BUY A BULK TANK

The 60,000 dairy farmers who had shifted to bulk handling by the summer of 1957 made up only about 10 percent of all farmers in the United States who have 10 or more dairy cows. The 60,000 is probably no more than 25 percent of the number that may ultimately have bulk tanks. For those farmers who have not yet shifted to bulk handling, the following checklist may provide a systematic approach to the decision when and if it must be made.

1. Am I likely to be faced with the problem of deciding whether or not to shift to bulk handling?---------- Yes ☐ No ☐

2. If so, how soon?------------------------------------
   1 year ☐
   2 years ☐
   3 to 5 years ☐
   Uncertain ☐

3. If my milk dealer shifts to bulk handling, would I be able to sell can milk to another dealer?--------- Yes ☐ No ☐
   Uncertain ☐

4. If so, is the hauling charge for can milk likely to increase over the next few years?------------------ Yes ☐ No ☐

5. If I should stop selling milk, could I have an adequate income from other farm enterprises, from off-farm work, from retirement sources, or from a combination of these?---------------------------------- Yes ☐ No ☐

Uncertain ☐

6. If I shift to bulk handling, will I receive a price premium or reduced hauling charge for my milk?----- Yes ☐ No ☐

7. If so, how long is the premium or reduced hauling charge likely to continue?------------------------ 1 year ☐

Several years ☐

Indefinitely ☐

8. If I shift to bulk handling, how large a tank will I need?

   a. Should I plan on daily or every-other-day pickup?-- Daily ☐

   Every-other-day ☐

   b. Can I expect to reduce my peak production relative to my daily average for the year?----- Yes ☐ No ☐

   c. How much reserve should I allow for future expansion?--------------------------------------- None ☐

   25 percent ☐

   50 percent ☐

   100 percent ☐

9. If I shift to bulk handling, will I have any expenses other than the tank?

   a. Will I need a new milkhouse?------------------ Yes ☐ No ☐

   b. Will my present milkhouse need remodeling?----- Yes ☐ No ☐

   c. Will it need rewiring?------------------------ Yes ☐ No ☐

   d. Will I need a new water heater or other new equipment?---------------------------------- Yes ☐ No ☐

10. If I shift to bulk handling, can I expect a substantial trade-in for my can cooler and cans?----- Yes ☐ No ☐

11. If I shift to bulk handling, should I get direct-expansion or an ice-bank type tank?

    a. Will the difference in initial cost be significant?------------------------------------ Yes ☐ No ☐

    b. Will the difference in operating cost be significant?------------------------------- Yes ☐ No ☐

    c. Is there any danger of a demand charge for electricity if I install a tank with a large motor?------------------------------------- Yes ☐ No ☐

12. If I shift to bulk handling, should I also consider certain related equipment or methods such as:

	Yes	No	Already have
a. Pipeline milker?	☐	☐	☐
b. Milking parlor?	☐	☐	☐
c. Loose housing?	☐	☐	☐

13. If I shift to bulk handling, can I pay for the installation from milk saved and from price premiums?------------------------------------ Yes ☐ No ☐

14. If I shift to bulk handling, will I feel compelled to increase production to pay for it?---- Yes ☐ No ☐

15. If so, will this fit into my long-time plan for organizing and running my farm?---------------- Yes ☐ No ☐